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TECHNOLOGISTS OF SOUTH AFRICA

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EDITOR:
CECIL R. STUART

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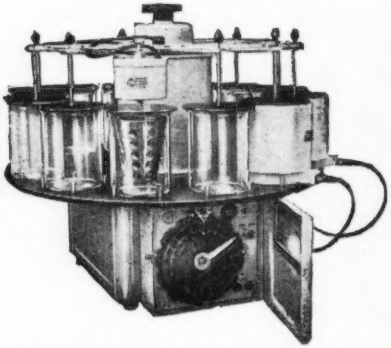

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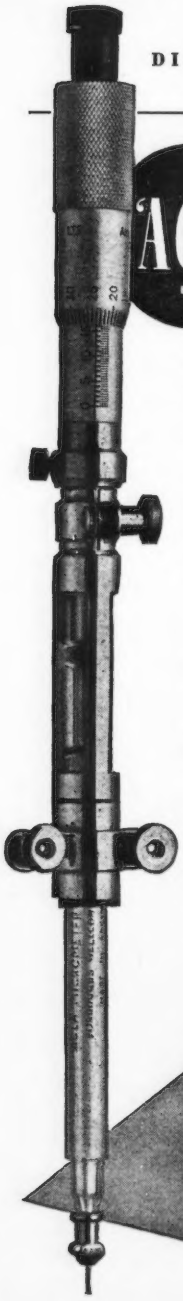

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REDAKSIONEEL

Die mediese laboratorium tegnoloog lê hom alhoemeer toe op Spesialisasie. Die bewering dat daar so iemand as 'n Mediese laboratorium tegnoloog is wat homself geheel tuis voel in alle vertakkings van Mediese Tegnologie, is onjuis. Op die meeste kan hy slegs gedeeltelik gekwalifiseerd wees in al die verskillende afdelings. Dit is klaarblyklik dat die spesialis Mediese tegnoloog 'n absolute vereiste is, beide met die oog op 'n praktiese vooruitgang van sy wetenskap en uiteindelike erkenning van professionele status vir Mediese Laboratorium Tegnokologie.

Die Student-tegnoloog moet 'n algemene opleiding gegee word in Mediese Laboratorium tegnokologie.

Nadat die algemene opleiding verby is behoort hy hom toe te lê op Spesialisasie.

Die Senior tegnoloog, omrede ondervinding vaardigheid of hoër kwalifikasies, en 'n meester in sy vak, behoort in bevel van sy departement te wees.

Die Hoof Tegnoloog wie 'n deeglike kennis behoort te dra van alle aspekte van Mediese Laboratorium Tegnologie moet ook 'n besondere aanleg vir administratiewe sake hê. Om hierdie rede sal dit moontlik wees om vroeg in sy loopbaan 'n tegnoloog uit te sonder as begaafd net soos dit moontlik was vir baie jare al om 'n sukses volle besigheidsman uit te ken.

Die ou en ondoeltreffende wyse van bevordering soos dit nog steeds in werking is in baie laboratoria d.w.s. jare van ondervinding as maatstaaf vir bevordering in stede van doeltreffendheid, sal vanselfs brekend afgeskaf moet word.

Die resultaat sal stabiliteit meebring. Groter doeltreffendheid, beter kanse op vooruitgang, aanmoediging tot verdere studie en gevolglik toenemende vermoe kan verwag word. Daar benewens sal daar die wete wees dat erkenning, wargewing en beloning volg op persoonlike opoffering.

EDITORIAL

The Medical Laboratory Technologist is fast becoming a specialist. To state that there is such a person as an all-round Medical Laboratory Technologist is a fallacy; at best he would be only partly qualified in each of the fields of Technology. It is obvious that the specialist Technologist is an absolute necessity, both to the practical advancement of his science, and also to the realisation of recognition of professional status for Medical Laboratory Technology.

To extrapolate the idea of specialisation:—

The student Technologist would be given a general education in Medical Laboratory Technology.

The Technologist having completed his general training will be settling into his specialisation.

The Senior Technologist, being an expert in his subject, by experience, efficiency and merit, or by high level examination taken, would be in charge of the department.

The Chief Technologist who would have an all-round knowledge of Laboratory Technology with a special aptitude for administration. This would indicate that such a person would be singled out rather early in his training in exactly the same manner as successful business executives have been for many years.

The ancient and inefficient method of advancement adhered to by most Laboratory services, that is, for years of service to be the criterion for promotion, regardless of the ability of the promotee, will of necessity be abolished.

The result would be a more efficient and stable profession, which would allow opportunity for advancement, and stimulate the ambition to further one's knowledge and ability, knowing that it would be recognised, appreciated and rewarded.

A REVIEW OF SOME ASPECTS IN THE EVOLUTION OF HISTOLOGICAL STAINING

A. SCOTT,

Department of Pathology, Medical School, Durban.

The work of the microscopist started in earnest in 1849, when the botanists GOPPERT and COHN used carmine to render more evident the contents of NITELLA FELEXILIS, although HILL, nearly eighty years earlier had used a dye in staining the microscopic structures of timber. Hill's work in 1770 was, beyond question actually histological in nature, and it seems a pity that such a long time was to elapse before dyes (or stains) were to be used in microscopic study.

Carmine

The researches of GOPPERT and COHN stimulated HARTIG, between the years 1854 and 1858, to employ carmine for staining the chlorophyll granules of plants.

His work attracted little attention however, and GERLACH (1858) must be regarded as the real founder of the practice of staining.

It is interesting to reflect in any speciality how advances arise. Sometimes it is the result of chance and lucky discovery; more often it is the result of hard work and methodical research.

Gerlach was led to the discovery of carmine staining by observing that tissues, after injection with badly-prepared carmine gelatine, became coloured. He then proceeded to stain with ammoniacal carmine, but failed for a long time to get satisfactory results. A fortunate accident then occurred. A section of cerebellum, hardened in potassium bichromate, was left by an oversight in an exceedingly dilute solution of ammoniacal carmine and, when found twenty-four hours later, was beautifully stained, with the nerve fibres and nerve cells well differentiated. Previous failures had been due to the use of too concentrated carmine solution. Carmine was the first dye to be used by the microscopist and was widely applied to cytological studies.

Carmine is derived from *Cochineal*, and the latter is a product obtained by drying and grinding the bodies of the cochineal insect *Coccus Cacti*, a native of Mexico. It was cultivated and used for dyeing in that country long before the Spanish conquest.

Carmine is a natural dye.

Haematoxylin

The histologist and perhaps even more the cytologist, were quick to appreciate the value of haematoxylin. WALDEYER in 1863 was the first to use haematoxylin in the form of a watery extract of logwood—to obtain by its means a sharp staining of axis cylinders—but without much success.

To BOHMER in 1865, because of his publication of scientific formulae, must go the credit of introducing haematoxylin to histology. He recommended the use of haematoxylin crystals in combination with alum, the latter acting as a mordant.

The first to use alum haematoxylin in the acid solution was EHRLICH in 1886, while MARTIN HEIDENHAIN in 1891 introduced the iron haematoxylin method. Later HARRIS used mercuric oxide for the conversion of haematoxylin into haematein.

This unusual dye has been in use for more than seventy years. The staining solutions devised by Ehrlich, MAYER, WEIGERT, and DALAFIELD are used constantly in the modern laboratory for the study of the cell, particularly the nucleus, while the iron haematoxylin method of Heidenhain remains to this day the standard technique of the cytologist.

Haematoxylin is derived from logwood (*Haematoxylin Campechianum*). It is usually prepared by treating commercial logwood extract with ether. As obtained on the market, haematoxylin is in the form of small crystals. Commonly, they range in colour from yellow to rusty purple. In the dry condition the powder keeps indefinitely. It is soluble in water, glycerine and alcohol. Haematoxylin is commonly used in aqueous solutions, either plain or combined with a mordant. It does not stain directly; but only after it has been oxidised to haematein and in stains operating progressively, this process must occur before use. In most cases this is accomplished by allowing it to "ripen", which is a process of slow oxidation. This may be more readily accomplished by the addition of a small quantity of hydrogen peroxide to the solution.

Aniline Dyes

About the time GERLACH was working successfully with carmine, four years earlier in fact, WILLIAM PERKINS, while still a youth, made his epoch-making discovery of an aniline dye, the result of which was to revolutionise the dyeing industry and incidentally miscroscopic science as well. The story is told of how he tried unsuccessfully to synthesize quinine, but attracted by the violet stains which he noticed, was sidetracked from his investigation and led into new work which resulted in the isolation of the first aniline dye.

He called the dye "mauve" and it was the first synthetic dye to be manufactured on a commercial scale. Perkins took out a patent in 1856 and it is thought that he made his discovery two years earlier.

After he had shown the way, the discovery of other dyes followed rapidly. Basic fuchsin was manufactured in 1856. The discovery of various other dyes which now have histological use occurred as follows: Safranin in 1859; methyl violet in 1861; aniline blue in 1862; eosin and methyl green 1871; thionin and methylene blue in 1876; acid fuchsin 1877; orange G 1878; sudan III 1880; and crystal violet 1883.

The first suggestion of the use of aniline dyes in histology seems to have been made by BENEKE in 1862, who employed acetic acid coloured with a dye which he called "lilac aniline".

Trichrome Stains

With the introduction and firm establishment of aniline dyes and haematoxylin, microscopy forged ahead and towards the end of the nineteenth century many new staining methods were devised. Workers of that time took a delight in "dabbling with dyes"; but were always noting and investigating. Soon it was observed that certain stains had an affinity for certain tissues. In some cases it was an elective affinity—that is to say, the preference of the stain for one particular tissue or cell element—this in modern technical speech is a specific stain. In other cases, even when the stain used stained the tissues uniformly, certain elements in the tissues would give up the stain if de-stained or differentiated, the unstained portion could then be restained a different colour. This led to double and triple or trichrome staining.

In the late eighties and early nineties of last century, triple aniline stains were introduced into cytological and histological work. Ehrlich's "triacid mixture" (methyl-green, acid fucshin and orange G), while primarily intended for the differential staining of granules in white blood cells, was adapted in 1888 by Heidenhain to the staining of tissues, especially thin sections.

Another method which remains from this period is the FLEMMING triple stain, in which safranin was followed by gentian violet and then decolourised in orange G.

Mallory in 1900 described a method for the differential staining of connective tissue, by which he used acid fuchsin, orange G and W.S. aniline blue. The nuclei, elastic fibres, axis cylinders and fibrin stain red. Red blood corpuscles and myelin sheath stain yellow, while the reticulum of connective tissue and amyloid and mucous stain blue. Two other substances, oxalic acid and phosphomolybdic acid, are included. The former makes the aniline blue stain more intensely. The latter has two functions: it intensifies and fixes the acid fuchsin in certain histological elements (nuclei particularly), while removing it from others (connective tissue); it thus smooths the action of aniline blue and enables it to select the connective tissue.

Masson went a step further, using Regand's haematoxylin to stain the nuclei, Ponceau de Xyladeine to stain the cytoplasm and aniline blue to stain the connective tissue. This method was devised about 1929. Later he modified his method using Ponceau acid fuchsin (to give a wider range of red to the cytoplasm) and light green for the connective tissue.

The modern histological laboratory has seen changes and has advanced. In the inter-war and post-war years many new staining techniques have been devised. However, staining methods, with slight modification, derived at the end of the last century, are used with advantage today.

A SIMPLE METHOD FOR COUNTING STAINED CELLS IN THE C.S.F.

R. M. I. SNYMAN,

Medical Technologist, Pathological Laboratory, Medical Clinic, Vanderbijlpark.

The following simple but accurate method for counting cells in the cerebro- spinal fluid has been evolved in this laboratory in an effort to reduce to a minimum the amount of fluid necessary for this investigation.

Principle

Cells are stained directly in the haemacytometer by coming into contact with a fine film of brilliant cresyl blue previously deposited on the glass surface of the counting chamber.

Staining Solution: 1.0% Brilliant Cresyl Blue in Absolute Alcohol.

Method: Using a cotton wool swab as a brush, apply the brilliant cresyl blue in alcohol to the ruled surface, or coverglass of any haemacytometer. Wait a few seconds for the alcohol to evaporate. Now place the coverglass in position and fill the chamber with the well-mixed undiluted C.S.F. The cells will take up the stain immediately, and may be counted as soon as they have settled. When calculating the results, remember to exclude the usual dilution factor.

No attempt should be made to differentiate the cells in the chamber. A portion or all of the remainder of the fluid should be centrifuged

and the cells differentiated after being fixed on a slide and stained by any of the usual techniques. The supernatant fluid is preserved for further investigations:

The advantages of this method are:

(1) Accuracy, in that any dilution error is eliminated.

(2) A minimum of material is used. Less than 0.15 ml. is required for the whole test. This means that in those cases where only small amounts of materials are available, further valuable information can be obtained from tests which otherwise would have been impossible.

Summary: A method has been evolved for staining and accurately counting cells in the C.S.F., using a minimum amount of material.

The author is grateful to Dr. J. Craig Cochrane for his criticisms and help in preparing this short paper.

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AN INTRODUCTION TO RHESUS GROUPING

P. P. MOORES

Rhesus Laboratory, Addington Hospital, Durban.

(First published "News and Views", March, 1954)

At the turn of this century an eminent doctor by the name of Karl Landsteiner made a very great contribution to humanity. As a direct result of his work the techniques of successful blood transfusion improved enormously in the years that followed, and the therapeutic advantages of the practice were gradually recognised and accepted by the medical profession.

Landsteiner began by experimenting with his colleagues. While mixing some samples of their bloods he noticed that often the cells of a mixture would agglutinate or come together in coarse irregular masses, while at other times samples mixed together would undergo no apparent alteration, remaining perfectly homogenous. This led him to divide human beings into four groups which he called separately A, B, AB, O; and at the same time to recognise that an individual would be incapable of receiving blood from any but a member of his own group or from the universal donor group—O.

The main dangers in blood transfusion were now clarified and could be avoided by careful laboratory investigation beforehand. In spite of this and the introduction of blood laboratories equipped to perform as a routine the task of cross-matching the patient's with the donor's blood satisfactorily before every transfusion, there still persisted, however, an occasional unexplained fatality.

Landsteiner and Wiener, Levine and Stetson in 1939-1940 established that another set of blood groups was the cause. In the process of research they introduced the blood cells of the Rhesus monkey into a rabbit and found that the rabbit serum subsequently possessed the property of agglutinating the blood cells of 85% of the Europeans available at the time.

This new blood group was called the Rhesus Factor and the 85% Europeans became classed Rhesus Positive.

Soon afterwards the serum of patients who had suffered a haemolytic transfusion reaction and of many of the unexplained fatalities were shown frequently to have the same peculiar property. Moreover these patients were all Rhesus negative, being numbered in other words among the 15% whose blood was unagglutinable by the original rabbit serum. The determination of the Rhesus factor now became essential in blood transfusion.

Round about the same time investigators found a third source of agglutinating serum, or Rhesus antibody, which for the first time linked blood groups with real disease. It was already known that mothers who had one or more normal pregnancies and were quite normal themselves, might suddenly produce a child suffering from haemolytic anaemia and jaundice at or soon after birth. In the serum of these mothers the Rhesus antibody could frequently be demonstrated both before and after birth, and again they were all Rhesus negative. It therefore became of the utmost importance to extend Rhesus grouping to all pregnant mothers, and to test all who were found to be Rhesus negative for the possible presence of the antibody before they came to term. This singled out the mothers whose children were likely to be affected and made possible the introduction of rapid tests on the cord blood at birth, followed by immediate exchange transfusion if necessary to remove as much of the infant's "poisoned" blood as possible.

The mechanism by which mothers develop the Rhesus antibody is still in some doubt but it is felt that the modern interpretation must be very near the truth. Experience with blood transfusion has taught us that the Rhesus antibody forms in the blood of a Rhesus negative individual shortly after the introduction of Rhesus positive blood, however small the quantity may be. That the antibody does not always develop may be explained by differences in the relative sensitivity of individual patients, and such differences are known from the study of bacterial antibodies.

It would seem reasonable to assume therefore, that a mother, unless previously sensitised by a blood transfusion, becomes exposed by the escape into the circulation of a small quantity of blood from her unborn child. This process is believed to occur towards the latter end of the pregnancy, and the first child is usually unaffected. In succeeding pregnancies the antibody, having been already stimulated, increases in strength and may affect the child. Leakage most probably occurs at the time of delivery across the placenta, especially if there has been any tendency to haemorrhage, premature birth or a caesarian section which might have damaged the placenta.

The child inherits its Rhesus positive factor from its father. If the father was Rhesus negative then no immunisation would occur and the child would be perfectly normal. The Rhesus antibody formed in the serous part of the mother's blood to destroy Rhesus positive cells passes through the placenta and encounters large numbers of these cells in the body of the foetus. The process of destruction is then initiated.

Observations with a large number of cases of this kind have shown that, although the maternal antibody could be demonstrated throughout pregnancy, the child only showed signs of being affected at or soon after birth. This might be explained in one of two ways. Either the

placenta proves a sufficient barrier to the antibody molecule until just before delivery, or the mother herself copes with the products of the child's cell destruction and, at birth, when the child's own organs are brought into active function these are incapable of dealing with the necessary elimination of the affected cells.

In either case, the result is known as Haemolytic Disease of the Newborn, characterised by marked anaemia, jaundice within the first twelve hours, enlargement of the spleen and the liver, petichial haemorrhages of the skin and general lethargy. If the disease is sufficiently severe kernicterus may develop and death may occur within three days. Sometimes the child is born in the condition known as Hydrops Foetalis. Oedema and anaemia are very marked and death usually occurs in a few minutes. There is little or no jaundice. It is possible that in these cases the antibody exerted its effect for some time before birth and the products of cell breakdown were eliminated by the mother, thus explaining the absence of jaundice.

The only method of treatment so far in general practice involves the removal immediately after birth of as much as possible of the affected blood from the child by exchange transfusion with unaffected Rhesus negative blood from a normal donor. This is done in conjunction with the findings of laboratory tests on the cord blood which give the best indication of the extent to which the disease has already progressed. The tests used are the Direct Coombes Test, an anti-globulin serum capable of agglutinating the sensitised antibody globulin-coated red cells; the haemoglobin; the normoblast count; the Rhesus factor determination; and the serum bilirubin. No hard and fast rule can be made in reading the information obtained, but generally speaking, if the Direct Coombes test is positive, the haemoglobin is lower than 14.0 grammes, the normoblast ratio above 10 per 100 white cells and the serum bilirubin is 4.0 mgm% or over, an exchange transfusion must be done.

To aid doctors in the rapid assessment of the child's condition at birth and to standardise the technique, a Rhesus Clinic has been in operation at Addington Hospital, Durban, since 1951. The majority of pregnant mothers are now tested ante-natally at least once, and those in whom the Rhesus antibody is found are asked to come to the clinic for their delivery. A doctor and a medical technologist are always on immediate call and an exchange transfusion can be in operation within an hour of birth, if necessary.

Since 1951 the numbers of children recovering has increased immeasurably, and emphasises to the full the importance of ante-natal tests, in accordance with which the Rhesus Grouping Laboratory is now enjoying the co-operation of the majority of hospitals and private practitioners with their pregnancy cases, both European and non-European, throughout Natal.

THE NERVE IMPULSE

A Synopsis of a lecture given to the Branch of the Society by Dr. S. H. Ripley of the Department of Physiology, University of Natal, on the 8th August, 1957.

The speaker commenced by describing briefly the physiology of the medullated nerves, these being the type his lecture was primarily concerned with. He went on to say that when a nerve is "excited" an electrical potential is set up and chemical changes take place. When resting, a nerve fibre contains a large amount of potassium and small amounts of sodium, magnesium, etc., although the potassium ions are smaller. But when excited a marked chemical change is observed. The potassium diffuses through the membrane of the nerve, the sodium content increases, bringing about an alteration in the electrical potential.

The phenomena of the change is permeability of the membrane, the action of sodium diffusion by what is known as the "sodium pump" is not fully understood.

Members were now invited to a demonstration. This consisted of visual and aural observation of nerve impulses of a grasshopper.

Dr. Ripley had exposed the nerve of the living insect, and with the aid of a micro-manipulator was able to demonstrate on an oscillograph and audio-amplifier the impulses of various nerves.

The lecture and demonstration proved to be most interesting, and Dr. Ripley, after answering numerous questions, was thanked on behalf of members by Mr. A. Scott, Chairman of the Branch.

COUNCIL MEETING, JULY, 1957

The Society's Council met for the 1957 Annual Meeting at the South African Institute for Medical Research, Johannesburg, on the 29th/30th July.

Members present were: Dr. F. A. Brandt, Dr. B. Wolstenholme and Mrs. G. M. Tomlin of the S. Transvaal Branch, Mr. J. H. Maytham and Mr. G. A. Stewart of the Cape Branch, Mr. P. N. Buck, Mr. J. L. Herrick and Mr. A. Scott of the Natal Branch, and the Hon. General Secretary, Mr. G. W. Wikeley.

In the absence of the President, Dr. F. A. Brandt was elected to the Chair.

Arising from this meeting the following points of general interest to members were noted:

(i) Membership of the Society is steadily growing with the direct consequence that the Society now speaks for the majority of medical technologists in the Union.

(ii) The South African Journal of Medical Laboratory Technology experiences some publication difficulties as do all new projects, but if members will support it by ensuring that an adequate supply of worthwhile material is available, the Editor's burden would be lightened.

(iii) The Society had been represented at a meeting of a Special Committee at which the South African Medical and Dental Council investigated the views of the Society, of Pathologists and of the larger employers such as the Union Health Department and the Provincial Administration on the necessity for maintaining a Register of Medical Technologists, which body should maintain the Register, the method of registration and the control of the necessary system of training. At this meeting it was decided that it was necessary for Medical Technologists to be registered and that the South African Medical and Dental Council should maintain the Register. It was also agreed that a National Certificate or Diploma issued by a central examining board was a matter of immediate concern and that Medical Council be asked to take steps to institute such a board or committee as a matter of urgency. Council discussed the implications of this and agreed that the Society should give all the help in its power to ensure a high standard in the teaching and examining of medical technologists. It was hoped that steps would be taken in this regard before the end of the year. Council asked the three branches each to nominate one representative to the proposed committee so that no delay would ensue on receipt by the Hon. General Secretary of an invitation to be present at the first meeting.

(iv) President and Vice-Presidents. The retiring President, Dr. J. C. Thomas would be asked to continue his association with the Society as a Vice-President for the current year. Professor E. H. Cluver was unanimously elected President. Professors J. Barnetson and J. Thompson, and Doctors I. Bersohn, R. Elsdon Dew, and A. Kipps were elected Vice-Presidents.

It was proposed that a CODE OF ETHICS be introduced similar to those in America and England. It was decided to refer this for discussion at branch level.

It was decided to hold the next Council Meeting not later than 30th June, 1958.

AMENDMENTS TO THE CONSTITUTION

At the Council Meeting referred to elsewhere in this issue, the following amendments to the Constitution were approved.

Section 5, sub-section c: after the word "training" insert

"and who has not completed three years' service as specified in sub-section b above".

Section 12, sub-section 3: delete

"one-third" and substitute "one-quarter".

LETTER TO THE EDITOR

9 Harley Street,
London, W.1.

The Editor,
The South African Journal of Medical Laboratory Technology.

Dear Sir,

I was interested in the letter by Mr. Peter N. Buck, which was published in the September 1957 issue of your Journal, concerning the operation of the code of professional conduct recently established by this Institute.

It is apparent from Mr. Buck's letter that he may have misinterpreted the operation of the code of ethics when he suggests that technologists who are asked opinions on pathological speciments should decline to give them. The code of professional conduct states that a member of this Institute should not "hold himself out as a person who by training and experience is professionally qualified to diagnose or treat disease in man or animals". That does not preclude him from expressing opinions where they are enlisted, provided that he does not imply that his qualifications and experience entitle him to do so.

Yours faithfully,
R. J. LAVINGTON,
General Secretary.

OFFICIAL APPOINTMENTS

LABORATORY TECHNICIAN (Male or Female) required by Uganda Government Medical Department for tour of 30/36 months in first instance, either (a) on probation for pensionable employment or (b) on contract, with gratuity at rate of 13½% of total salary drawn. Salary scale (including inducement pay) £846 rising to £1,566 a year. Commencing salary according to qualifications and experience. Outfit allowance £30 usually payable. Free passages. Liberal leave on full salary. National Health Service superannuation rights can be preserved in approved cases. Candidates must be A.I.M.L.T. Female candidates must be SINGLE. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M3/44320/LAQ.

MEDICAL LABORATORY TECHNOLOGIST (Male or Female) required by Nigerian Federal Government Medical Department for one tour of 12-24 months in first instance. Salary scale (including Inducement Addition) £834 rising to £1,386 a year. Commencing salary according to qualifications and experience. Gratuity at rate £100/£150 a year. Outfit allowance £60. Free passages for officer and wife. Assistance towards children's passages and grant up to £150 annually towards maintenance in U.K. Liberal leave on full salary. Candidates must possess A.I.M.L.T. and have wide experience of medical laboratory technique, including bacteriology and biochemistry. Female candidates must be SINGLE. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience, and quote M3/43647/LAQ.

LABORATORY TECHNICIAN (Physiologist) (male or female) required by East Africa High Commission for East African Veterinary Research Organisation for tour of 30/36 months either (a) on probation for permanency with free pension or contributory Superannuation Scheme at officer's option or (b) on contract with gratuity at rate 13½% of total substantive salary drawn. Salary scale (including inducement pay) £846 rising to £1,341 a year. Commencing salary according to experience. Outfit allowance £30. Free passages. Liberal leave on full salary. Candidates, aged 24-40, must possess A.I.M.L.T. preferably in Bacteriology, or equivalent, and have good practical knowledge of physiological laboratory technology. Female candidates must be SINGLE. Write to the Crown Agents, 4 Millbank, London, S.W.1. State age, name in block letters, full qualifications and experience and quote M3/43369/LAQ.

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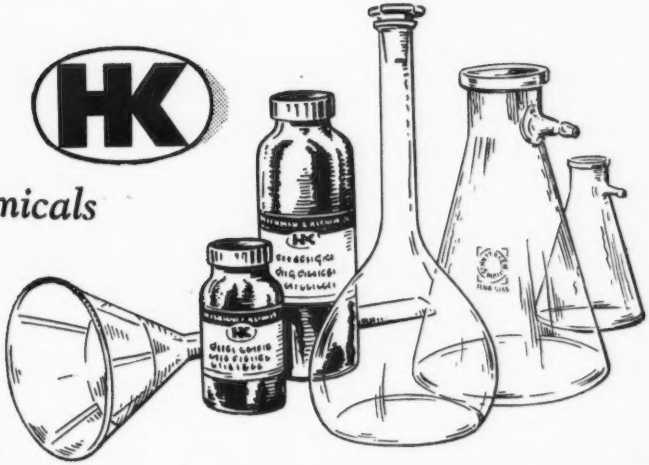

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All contributions are to be addressed to:—The Editor, The South African Journal of Medical Laboratory Technology, Room 213, Dept. of Pathology, Medical School, Umbilo Road, Durban.

Contributions may be written in English or Afrikaans, and should preferably be typed in double-spacing on foolscap sheets on one side of the paper only.

Figures should be drawn in Indian ink, and all figures and tables should be labelled as such (e.g. Figure 1, Table 1, etc.).

Authors should make adequate references to previous works on their subjects. These should be set out as follows:—Author's surname and initials of Christian names; the year of publication (in parentheses); the name of the journal, which should be abbreviated according to the World List of Scientific Periodicals (see below); the volume number (underlined); and the first page reference.

Example:—Moron, I. B. (1960). J. unsuccess. Med., 20, 99. References to books should give the author's name and initials, the year of publication, title of book, name of publisher, and town in which published.

References should be arranged in alphabetical order of the authors' surnames. If more than one work by the same author is listed, these should appear in chronological order.

Technologists are reminded that regulations demand that all original articles of a technical or scientific nature must be approved by the heads of their departments before being submitted for publication.

Title abbreviations according to World List of Scientific periodicals

All nouns commence with capital letters, and adjectives small letters. Articles, conjunctions and prepositions are omitted.

Examples:—

J. Amer. med. Ass.	*S. Afr. J. clin. Sci.*
Lancet	*Stain Tech.*
Amer. J. clin. Path.	*J. Bact.*

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If requested before publication, 24 reprints of original articles will be supplied free to contributors. As a temporary measure, contributors are asked to defray the costs of publishing diagrams and photographs accompanying articles.

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